

CLAIMS

- 1 1. A motor-fan unit comprising:
2 a motor assembly having a shaft, a commutator supported on said shaft, and
3 a pair of brushes in electrical contact with said commutator;
4 a fan assembly having fan coupled to said shaft;
5 an end plate assembly located between said fan and said motor assembly,
6 said end plate assembly including a plate portion defining an opening
7 throughwhich said shaft passes, wherein said commutator is located near said
8 opening; and
9 a pair of brush retainers adapted to receive said brushes formed on said
10 plate portion adjacent said commutator, said brush retainers opening toward said
11 fan assembly.
- 1 2. The motor-fan unit of claim 1, further comprising a plurality of resilient fasteners
2 formed on any of said motor assembly, end plate assembly and said diffuser
3 assembly and corresponding receivers formed on adjacent assemblies to effect tool
4 free attachment thereof.
- 1 3. The motor-fan unit of claim 1, further comprising a pair of dividers extending
2 axially from said plate portion toward said fan assembly, said dividers being
3 located on either side of said brush retainers.
- 1 4. The motor-fan unit of claim 1, wherein said brush retainer is generally U-shaped
2 having a first member extending axially toward said motor, a second member
3 extending outward from said first member and a third member extending axially
4 toward said fan assembly from said second member.
- 1 5. The motor-fan unit of claim 3, further comprising a notch formed between said
2 plate portion and said third member, said notch extending radially along at least a
3 portion of said portion of said third member such that said third member terminates
4 short of said plate portion such that said brush retainer opens laterally of said
5 brush.

- 1 6. The motor-fan unit of claim 4, further comprising a support member extending
2 from said end plate portion toward said motor assembly adjacent said third wall
3 and in supporting relation thereto.
- 1 7. The motor fan unit of claim 1, further comprising a spring assembly in operative
2 contact with said brush, whereby said spring assembly urges said brush toward said
3 commutator.
- 1 8. The motor fan unit of claim 6, further comprising a spring holder extending from
2 said end plate assembly receiving said spring.
- 1 9. The motor fan unit of claim 7, wherein said spring has a first leg and a second leg,
2 said spring holder including a first projection retaining said first leg, where in said
3 second leg urges said brush toward said commutator.
- 1 10. The motor fan unit of claim 8, further comprising a second projection formed on
2 said end plate assembly near said brush retainer, whereby said second leg of said
3 spring is receivable against said second projection to insert or remove said brush.
4 assembly.
- 1 11. The motor-fan unit of claim 1, further comprising a diffuser located between said
2 end plate assembly and said fan assembly, said diffuser having an opening in fluid
3 communication with said fan assembly and throughwhich said shaft is received,
4 said diffuser further having a pair of brush cap assemblies corresponding to said
5 mouth of said brush retainers, said brush cap assemblies adapted to be at least
6 partially received within said brush retainers.
- 1 12. The motor-fan unit of claim 11, wherein said brush cap assemblies each define a
2 channel in fluid communication with said fan assembly and open toward said
3 brushes.

- 1 13. The motor-fan unit of claim 11, wherein said channel extends radially substantially
2 along the entire length of said brush.
- 1 14. The motor-fan unit of claim 11, wherein said diffuser assembly further comprises
2 at least one channeling member extending axially toward said motor assembly,
3 wherein at least a portion of said projections extend axially toward said motor
4 assembly beyond said channeling members.
- 1 15. The motor-fan unit of claim 14, wherein said brush cap assemblies are located
2 adjacent a channeling member and wherein said a channel of said brush cap
3 assemblies is in fluid communication with said opening, said brushes, and
4 channeling member, whereby air from the fan flows through said opening into said
5 channel across said brushes and out of said channel where it is redirected by said
6 channeling member.
- 1 16. The motor-fan unit of claim 11, wherein said brush retainer and said end plate
2 assembly define a notch adjacent said plate portion and wherein said brush cap
3 assembly has raised edge receivable within said notch.
- 1 17. The motor-fan unit of claim 16, wherein said raised edge is formed on said portion
2 of said brush cap assembly extending into said brush retainers.
- 1 18. The motor-fan unit of claim 17, wherein said raised edge extends the length of said
2 brush cap assembly.
- 1 19. The motor-fan unit of claim 11, further comprising a projecting surface carried on
2 said brush cap assemblies adapted to engage a surface on said end plate adjacent
3 said brush retainer upon assembly such that said end plate assembly and said
4 diffuser are axially coupled.
- 1 20. The motor fan unit of claim 19, wherein said projecting surface extend radially
2 inward from said brush cap assemblies adjacent said opening; and

3 a commutator receiver formed on said end plate coaxially aligned with said
4 opening, said commutator receiver defining at least one notch corresponding to
5 said brush cap assemblies and adapted to receive said projecting surface, said notch
6 having a surface that lockingly engages said projecting surface upon insertion.

1 21. An end plate assembly in a motor-fan unit comprising:
2 a plate portion and a bracket portion adapted to be attached to the motor,
3 said plate portion having a commutator receiver formed thereon, said commutator
4 receiver defining a well that at least partially receives said commutator.

1 22. The end plate assembly of claim 21, further comprising a brush retainer integrally
2 formed on said plate portion, said brush retainer defining a mouth opening toward
3 the fan of the motor-fan unit.

1 23. The end plate assembly of claim 21, wherein said brush retainer includes a
2 generally U-shaped member extending axially toward the motor from the plate
3 portion about said mouth.

1 24. The end plate assembly of claim 23, wherein said brush assembly includes a first
2 member extending axially toward the motor from said end plate a second member
3 cantilevered from said first member forming the base of said U and a third member
4 extending axially toward the fan from said second member, wherein said third
5 member terminates short of said plate portion to define a notch therebetween.

1 25. The end plate assembly of claim 21 further comprising at least one notch formed
2 in said commutator receiver adapted to receive a snap locking projecting surface.

1 26. A diffuser in a motor-fan unit having a motor assembly and a fan assembly, the
2 diffuser comprising:
3 a plurality of channeling members spaced about a central bore, and a pair
4 of brush cap assemblies extending axially toward the motor assembly.

- 1 27. The diffuser assembly of claim 26, wherein said assemblies define a channel for
2 receiving air from the fan assembly in the motor-fan unit.
- 1 28. The diffuser assembly of claim 26, wherein said brush cap assemblies include a
2 projecting surface adapted to engage a surface on an end plate assembly in a snap
3 lock fashion to couple said end plate assembly to the diffuser.
- 1 29. A combination diffuser assembly and end plate assembly in a motor-fan unit
2 having a motor assembly and a fan assembly comprising:
3 an end plate assembly having a plate portion;
4 a pair of brush retainers extending axially toward the motor assembly from
5 said plate portion defining a mouth that opens toward the diffuser assembly;
6 a pair of brush cap assemblies formed on the diffuser assembly
7 corresponding to said brush retainers and at least partially extending into said
8 mouth.
- 1 30. The combination diffuser assembly and end plate assembly of claim 29, further
2 comprising a channel formed in each of said brush cap assemblies.
- 1 31. The combination diffuser assembly and end plate assembly of claim 29, wherein
2 said diffuser assembly and said end plate assembly are attached by one or more
3 resilient fastening assemblies.
- 1 32. The combination diffuser assembly and end plate assembly of claim 31, wherein
2 said resilient fastening assemblies include a projecting surface extending radially
3 inward from said brush cap assemblies adapted to engage a receiving surface
4 formed on said end plate assembly adjacent said brush retainers in a snap-locking
5 fashion.
- 1 33. The combination diffuser assembly and end plate assembly of claim 30, said end
2 plate assembly further comprising, a pair of dividers located on either side of said
3 each mouth.